TABLE OF CONTENTS

LIST OF ABBREVIATIONS

§	Section
BECC	Border Environment Cooperation Commission
CFR	Code of Federal Regulations
CWC	California Water Code
DO	Dissolved Oxygen
^{o}F	Degrees Fahrenheit
FRSH	Freshwater Replenishment
IBC	International Boundary Commission
IBWC	International Boundary and Water Commission
MGD	Million Gallons per Day
mg/L	milligrams per liter
MOU	Memorandum of Understanding
QAPP(s)	Quality Assurance Project Plan(s)
RARE	Preservation of Rare, Threatened, or Endangered Species
REC I	Water Contact Recreation
REC II	Non-Contact Water Recreation
Regional Board	California Regional Water Quality Control Board, Colorado River Basin Region
State Board	California State Water Resources Control Board
SWAMP	Surface Water Ambient Monitoring Program
TMDL(s)	Total Maximum Daily Load(s)
USEPA	United States Environmental Protection Agency
USFWS	United State Fish and Wildlife Service
USIBWC	United States Section of the International Boundary and Water Commission
WARM	Warm Freshwater Habitat
WILD	Wildlife Habitat

EXECUTIVE SUMMARY

INTRODUCTION

The New River, a water of the United States, is located in the southeastern portion of the Salton Sea Transboundary Watershed. This Watershed consists almost entirely of highly productive farmland irrigated with water imported from the Colorado River. The New River is one of the main tributaries to the Salton Sea, which is California's largest inland surface water. The climate is arid, with an average precipitation of less than three inches per year.

The River carries partially treated and untreated wastes from the Mexicali Valley in Mexico across the International Boundary into the United States. The River also receives treated disinfected and undisinfected domestic wastewater from Imperial Valley wastewater treatment plants. The New River's flow consists mostly of agricultural return flows from the Imperial Valley.

Trash is visible immediately downstream of the International Boundary, near and on the surface of the New River, and along the River's banks. Trash can carry pathogens, VOCs, organic matter, metals, and other pollutants, posing a significant threat to public health, fish, and wildlife communities. By the time flow in the New River from Mexico reaches the International Boundary, many pollutants from trash (e.g., raw sewage, oil barrels, tires, and paint cans) discharged upstream in Mexico have dissolved or leached into the River.

The California Regional Water Quality Control Board, Colorado River Basin Region (hereafter "Regional Board") is charged by the California Water Code (CWC) with protecting the Region's water quality. The Regional Board is also responsible for implementing pollution control measures required by the Federal Clean Water Act (CWA).

CWA Section 303(d) requires the State to list impaired water bodies and to establish Total Maximum Daily Loads (TMDLs) for those pollutants causing water quality impairments to ensure that impaired waters bodies attain their beneficial uses. A TMDL is pollutant-specific and is the maximum amount of a pollutant that a waterbody can assimilate and still meet beneficial uses.

In 2002, the Regional Board listed the New River on the CWA Section 303(d) List because trash (and others pollutants) violate water quality objectives that protect beneficial uses. These beneficial uses include: warm freshwater habitat (WARM); wildlife habitat (WILD); preservation of rare, threatened, or endangered species (RARE); water contact recreation (REC I); non-contact water recreation (REC II); and freshwater replenishment (FRSH) (Water Quality Control Plan, Colorado River Basin Region, as amended to date).

PROPOSED TMDL

This proposed Trash Total Maximum Daily Load (TMDL) report (hereinafter, "TMDL Report") was prepared to enhance water quality in the New River, pursuant to state and federal requirements, including the Porter-Cologne Water Quality Act (California Water Code sections 13000 et. seq.) and the federal Clean Water Act (33 U.S.C. sections 1251 et seq.). A TMDL quantifies the amount of a pollutant that a water body can receive and still meet water quality standards, and allocates pollutant loadings to the water body from point and nonpoint sources. The U.S. Environmental Protection Agency (USEPA) has oversight of the CWA section 303(d)

program (hereinafter, "303(d)") and must approve or disapprove the State's 303(d) List and each specific TMDL. USEPA is ultimately responsible for issuing a TMDL, if the State fails to do so in a timely manner.

Accordingly, the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Board) will be considering adoption of the proposed New River Trash TMDL that is set forth in this TMDL Report. For the purpose of this TMDL, "trash" is human-caused litter, defined in the California Government Code §68055.1, subdivision (g) as follows:

> "Litter means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the State, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling or manufacturing [….]."

This TMDL Report focuses on the New River immediately downstream of the International Boundary between the U.S. and Mexico, though the entire River is listed as impaired on the State's 303(d) List. This TMDL is the first stage of trash reduction in the New River. Trash is visible on the surface of the River mostly from the International Boundary downstream to Calexico (i.e., between the Border and Highway 98). However, trash has an impact on the water column that may extend to the River's terminus at the Salton Sea, because trash may leach or carry pollutants, thus causing secondary water quality impacts. The segment of the River impaired by secondary impacts from trash will depend on the types of contaminants transported or leached, contaminant fate and transport, and dilution from agricultural drains discharging into the New River downstream of the International Boundary. Secondary water quality impacts from trash will be difficult to characterize until pollutant sources for New River TMDLs addressing dissolved oxygen (DO) and volatile organic compounds (VOCs), both under development, and pathogens, under implementation, are eliminated.

The reach of the New River immediately downstream of the International Boundary area has been prioritized over other New River reaches because:

1. this area is closer to, and therefore more affected by, the major trash source (originating in Mexico) than are other downstream reaches;
2. reduced trash at the International Boundary area will lead to reduced trash in downstream reaches, and could eliminate the need for future revisions to the New River Trash TMDL;
3. reduced trash at the International Boundary will lead to a reduction in other pollutants (e.g., pathogens, VOCs, pesticides, organic matter, etc.) carried by or dissolved from trash;
4. information and data are scarce between Calexico and Brawley, and non-existent north of Brawley, thereby making an economic impact assessment only speculative for those reaches; and
5. limited Regional Board resources are being targeted on the most polluted areas in the Region.

The New River at the International Boundary is severely polluted by trash originating in Mexico. The trash impairment is due to the lack of a solid waste management plan to collect and properly dispose of municipal solid waste in Mexicali, resulting in littering of open lots, unpaved roads, the New River itself, and the River's tributaries within and peripheral to the Mexicali metropolitan area.

The Regional Board does not have the authority to require Mexico or the U.S. Government to reduce trash that crosses the International Boundary. However, the Regional Board has the ability to raise public awareness and apply political pressure on agencies that directly cooperate with Mexico on International Boundary issues. Therefore, this TMDL requests that the U.S. Government (i.e., the U.S. Section of the International Boundary and Water Commission (USIBWC) and the USEPA:

1. specify and implement measures to ensure that trash discharges from Mexico do not violate or contribute to a violation of this TMDL;
2. remove trash from Mexico that has accumulated at the Imperial County Calexico Landfill culverts; and
3. conduct water quality and trash monitoring in the New River at the International Boundary.

This TMDL further requests that other third party cooperating agencies and organizations increase their coordination of New River projects through a Memorandum of Understanding.

This TMDL is necessary because the U.S. Government has not met its past commitments and timelines in assisting Mexico with reducing multiple pollutants that chronically cross into the United States via the New River. Additionally, the New River is a designated Environmental Justice Pilot Project for the California Environmental Protection Agency. The goal of the Pilot Project is to develop a children's environmental risk reduction plan through a Regional Advisory Group comprised of community members, Tribal/local/federal government, and the Mexican government.

This TMDL seeks to achieve water quality objectives and protection of beneficial uses by reducing the amount of trash in the New River. The TMDL eliminates trash in two phases, and specifies allowable loads based on interim and final numeric targets. When allowable loads are achieved, they are expected to eliminate impairments. If impairments continue after implementation of phases I and II of this TMDL, and implementation of the New River TMDLs for DO, VOCs, and pathogens, the Trash TMDL will be revised to address pollutants leached or dissolved from trash in the New River that originates in Mexico.

1. PROBLEM STATEMENT

This section includes a description of: (a) the project area and background, (b) water quality objectives and beneficial uses, and (c) impairments caused by trash.

A. PROJECT AREA AND BACKGROUND

This TMDL is focused on the New River immediately downstream of the International Boundary. The New River extends about 20 river-miles within Mexico with headwaters located in Mexicali, a city of approximately one million people as of 2001 (Instituto Nacional de Estadistica Geografia e Informatica 2001). The flow rate of the River at the International Boundary is approximately 200 cubic feet per second (cfs). Within the U.S., the New River is about 60 river-miles long and terminates at the Salton Sea. The New River is one of the main tributaries to the Salton Sea, California's largest inland surface water. Other tributaries to the Salton Sea include the Alamo River, the Whitewater River, San Felipe Creek, Salt Creek, and Imperial Valley Agriculture Drains.

From a regional perspective, the New River is located in the southeastern section of the Salton Sea Transboundary Watershed (Figure 1), which is characterized on the U.S. side by highly productive Imperial Valley farmland that is irrigated with water imported from the Colorado River. The New River watershed drains about 200,000 acres of Imperial Valley, and about 300,000 acres of the Mexicali metropolitan area and agricultural Mexicali Valley, Mexico.

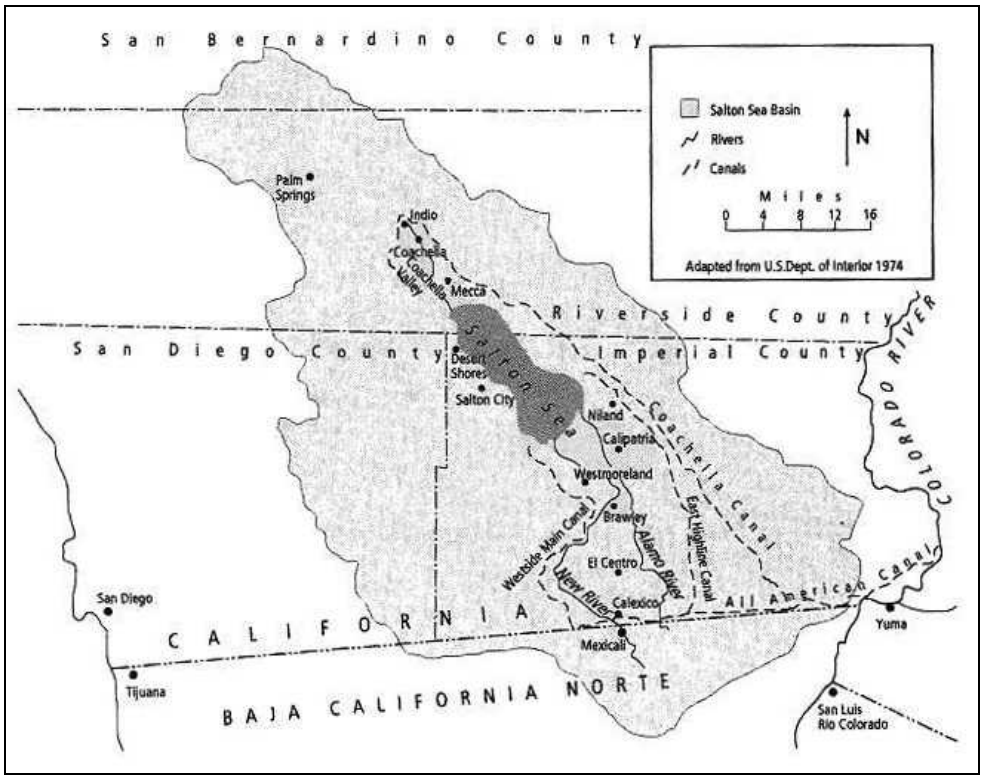

Figure 1: New River within the Salton Sea Transboundary Watershed
(Cohen et al. 1999)

The history of New River pollution is associated with Mexicali population growth and the inception of irrigated agriculture in the Imperial and Mexicali Valleys (Gruenberg 1998). In 1920, the total population of Mexicali was 6,200. By 1955, approximately 25,000 people lived in Mexicali. Raw sewage from Mexicali was discharged into the New River at that time, generating an odor near the International Boundary that was often overpowering. Flow in the New River increased considerably in 1956 due to the increase in agriculture in Mexicali Valley and the resultant discharge of irrigation return flows to the New River and its tributaries. This diluted the raw sewage temporarily, alleviating the odor at the International Boundary until the 1960s, when sewage loading to the River increased with Mexicali population growth. In 1978, the California Department of Health Services posted the New River as a public health hazard.

The New River is one of the most polluted rivers for its size in the United States. New River TMDLs for pathogens and sedimentation/siltation have been adopted by the Regional Board, and approved by the California State Water Resources Control Board (State Board), California Office of Administrative Law (OAL), and U.S. Environmental Protection Agency (USEPA) (Table 1). Both TMDLs are being implemented. New River TMDLs under development include those for DO and VOCs.

Table 1: New River TMDL Adoption and Approval Dates

	New River Pathogen	**New River Sedimentation/Siltation**
Regional Board Adoption	10/10/01	6/26/02
State Board Approval	3/21/02	11/19/02
OAL Approval	3/23/02	1/13/03
USEPA Approval	8/14/02	3/31/03

This TMDL is the first phase for trash reduction in the New River. The area immediately downstream of the International Boundary has been prioritized over other New River reaches because of the proximity to the major trash source that originates in Mexico. Additionally, reducing trash at the International Boundary of the New River will lead to a reduction in trash in downstream reaches and a reduction in pollutants (e.g., pathogens, VOCs, and organic matter) carried by or dissolved from trash.

B. WATER QUALITY OBJECTIVES AND BENEFICIAL USES

Basin Plan narrative water quality objectives related to trash, applicable to all surface waters in the Region, and applicable specifically to the New River, were established by the Regional Board to protect beneficial uses of waters in the Region. Documented violations of water quality objectives confirm that beneficial uses of the Region's surface waters have been and continue to be impaired. Table 2 summarizes water quality objectives for general surface waters in the Region. Table 3 summarizes water quality objectives specific to the New River at the International Boundary. Table 4 summarizes beneficial uses of the New River.

Table 2: Water Quality Objectives for All Surface Waters in the Region

Parameter	Water Quality Objective
Aesthetic Qualities	All waters shall be free from substances attributable to wastewater of domestic or industrial origin or other discharges which adversely affect beneficial uses not limited to: settling to form objectionable deposits; floating as debris, scum, grease, oil, wax, or other matter that may cause nuisances; and producing objectionable color, odor, taste, or turbidity.
Tainting Substances	Water shall be free of unnatural materials which individually or in combination produce undesirable flavors in the edible portions of aquatic organisms.
Toxicity	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.
Temperature	The natural receiving water temperature of surface waters shall not be altered by discharges of wastewater.
pH	Regional waters shall have a pH range from 6.0-9.0. Discharges shall not cause any changes in pH detrimental to beneficial water uses.
Dissolved Oxygen	The dissolved oxygen concentration shall not be reduced below the following minimum levels at any time: Waters designated: WARM…….. 5.0 mg/L COLD……. 8.0 mg/L WARM and COLD…….. 8.0 mg/L
Suspended Solids and Settleable Solids	Discharges of wastes or wastewater shall not contain suspended or settleable solids in concentrations which increase the turbidity of receiving waters, unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in turbidity does not adversely affect beneficial uses.
Total Dissolved Solids	Discharges of wastes or wastewater shall not increase the total dissolved solids content of receiving waters. Any discharge, expect from agricultural sources, shall not cause TDS (mg/L) in surface waters to exceed: Annual Ave. / Maximum New River…….. 4000 / 4500 Alamo River……4000 / 4500 Imperial Valley Drains……4000 / 4500 Coachella Valley Drains……2000 / 2500 Palo Verde Valley Drains……..2000 / 2500
Sediment	Suspended sediment load and discharge rate to surface waters shall not be altered to cause nuisance or adversely affect beneficial uses.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.
Radioactivity	Radionuclides shall not be present in waters in concentrations which are deleterious to human, plant, animal or aquatic life or that result in accumulation in the food web to cause hazard to human, plant, animal or aquatic life.

<table>
<tr><td>Bacteria</td><td>In waters designated for REC I or REC II (except for the Colorado River):

<u>Indicator Parameters</u> | <u>30-day Geometric Mean[a]</u> | <u>Maximum</u>
Fecal Coliforms | 200 MPN[b]/100 ml | c
E. Coli | 126 MPN/100 ml | 400 MPN/100 ml
Enterococci | 33 MPN/100 ml | 100 MPN/100 ml</td></tr>
<tr><td>Biostimulatory Substances</td><td>Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses. Nitrate and phosphate limitations will be placed on industrial discharges to New and Alamo Rivers and irrigation basins on a case-by-case basis, taking into consideration the beneficial uses of these streams.</td></tr>
<tr><td>Chemical Constituents</td><td>No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.</td></tr>
<tr><td>Pesticide Wastes</td><td>Discharge of pesticidal wastes from pesticide manufacturing, processing, or cleaning operations to any surface water is prohibited.</td></tr>
</table>

(Water Quality Control Plan, Colorado River Basin Region, as amended to date)

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a. Based on a minimum of no less than 5 samples equally spaced over a 30-day period.
b. Most Probable Number.
c. No more than 10% of total samples during any 30-day period shall exceed 400 MPN/100 ml.

Table 3: Water Quality Objectives Specific to the New River at the International Boundary

Qualitative Standard Number	Qualitative Standard (Minute No. 264[1])
1.	The waters of the River shall be free of untreated domestic and industrial waste waters.
2.	The waters shall be free from substances that may be discharged into the River as a result of human activity in concentrations which are toxic or harmful to human, animal or aquatic life or which may significantly impair the beneficial uses of such waters.
3.	The waters of the River shall be essentially free from trash, oil, scum, or other floating materials resulting from human activity in amounts sufficient to be injurious, unsightly, or to cause adverse effects on human life, fish, and wildlife. Persistent foaming shall be avoided.
4.	The waters of the River shall be free of pesticides in concentrations which could cause harmful effects to human life, fish, and wildlife.
5.	The channel of the River shall be free of residual sludge deposits from domestic or industrial wastes.

(Water Quality Control Plan, Colorado River Basin Region, as amended to date)

[1] Minute No. 264 of the Mexican-American Water Treaty titled "Recommendations for Solution of the New River Border Sanitation Problem at Calexico, California – Mexicali, Baja California Norte" was approved by the Governments of the United States and Mexico effective on December 4, 1980. Minute No. 264 specifies qualitative and quantitative standards for the New River at the International Boundary.

Table 4: Beneficial Uses of the New River

Beneficial Use	Description
Warm Freshwater Habitat (WARM)	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat (WILD)	Uses of water that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates); or water and food sources for wildlife.
Preservation of Rare, Threatened, or Endangered Species (RARE)[2]	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
Water Contact Recreation (REC I)[3]	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.
Non-Contact Water Recreation (REC II)	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
Freshwater Replenishment (FRSH)	Uses of water for natural or artificial maintenance of surface water quantity or quality.

(Water Quality Control Plan, Colorado River Basin Region, as amended to date)

[2] Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Regional Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Board.

[3] Although some fishing occurs in the downstream reaches, the presently contaminated water in the River makes it unfit for any recreational use. An advisory has been issued by the Imperial County Health Department warning against the consumption of any fish caught from the River and the River has been posted with advisories against any body contact with the water.

C. IMPAIRMENT OF THE NEW RIVER BY TRASH

Data indicate that the New River is impaired by trash immediately downstream of the International Boundary. Regional Board staff has observed trash floating into the U.S. during monthly water quality monitoring events of the New River (Figueroa-Acevedo, personal communication, 2004). Regional Board staff has routinely documented trash in Mexican drains/reaches in Binational Observation Tour reports of the New River (California Regional Water Quality Control Board 2003a-e, 2004, 2005). The Imperial County Sanitation Department removes about 120 tons/year (20 tons every other month) of trash that accumulates where the New River intersects the Imperial County Calexico Landfill located about four miles downstream of the International Boundary (Imperial County Sanitation Department 2003).

Trash is visible mostly on the water surface immediately downstream of the International Boundary. However, trash has an impact on the water column that may extend to the New River's terminus at the Salton Sea for some contaminants because trash may carry or leach other pollutants, thus causing secondary water quality impacts.

Trash as an Impairment to Fish and Wildlife Communities

The New River is in the Salton Sea Watershed and is an important component of the Pacific Flyway, a major bird migratory route connecting Canada and the U.S. to Mexico and Central America. The degradation of wetland habitats elsewhere along the Pacific Flyway has rendered the Salton Sea Watershed vital habitat for migratory avian species (USFWS 1997).

The presence of trash in the water column and in sediments threatens fish and wildlife communities, causing diversity to decrease as sensitive species disappear. In the water column, trash can: (1) cause death or growth inhibition due to physical injury through trash entanglement or ingestion, (2) create physical barriers that impede/modify natural movement and migration, (3) reduce food abundance available to fish, (4) reduce light penetration, which reduces the ability of aquatic vegetation to grow and produce oxygen, (5) increase water temperature by slowing water flow, (6) decrease dissolved oxygen by providing a food source for microorganisms that also consume oxygen, and (7) increase nutrient levels when organic matter in trash dissolves and decomposes in the water.

In bottom deposits, trash can smother bottom-dwelling organisms, spawning areas, and fish eggs, contaminate sediments, and degrade habitat. In riparian habitat, trash can bury tree and shrub roots as well as reeds, cattails, and arrowheads used for food and cover. Riparian areas constitute sensitive habitat, as they provide important habitat for songbirds and serve as potential wildlife movement corridors.

In wetland habitat, trash can choke out plants used for food and cover, and drastically reduce the health and numbers of organisms at the base of the food web (e.g., plankton, detritus, and aquatic vegetation). Wetlands in the New River delta at the Salton Sea are a critical stop for migrating birds on the Pacific Flyway. Trash in the New River at the International Boundary may leach contaminants or may travel to and degrade the Salton Sea.

Trash as a Source of Pathogens, VOC, Organic Matter, and Other Pollutants

Trash serves as a carrier for pathogens, VOCs, metals, organic matter, and other pollutants that threaten public health as well as fish and wildlife communities. By the time flow in the New River from Mexico reaches the International Boundary, many pollutants (e.g., pathogens, VOCs, and metals) have dissolved or leached into the water from trash (e.g., raw sewage, oil barrels, tires, and paint cans) deposited upstream in Mexico.

Water in the New River at the International Boundary is a green-brown color, indicating high levels of organic matter, nutrients, and algae (Setmire 1984), all of which decrease DO. The water is turbid and discolored to the point that the channel bottom (three to four feet deep) is not visible. New River water quality data collected about 0.5 miles downstream of the International Boundary shows DO concentrations of 0 to 1.2 mg/L (California Regional Water Quality Control Board 1998-2004), which are far lower than the Basin Plan water quality objective that mandates a minimum DO level of 5.0 mg/L.

The New River is listed on the State of California's Section 303(d) List as being impaired by sediments, pathogens, multiple VOCs, DO, and trash. Implementation of this Trash TMDL will help reduce impairments caused by constituents (e.g., pathogens, VOCs, metals, and organic matter) that trash carries and leaches. The New River currently is contaminated to the extent that it is unfit for any recreational use. Accordingly, the New River is the subject of public health warnings that advise the public against consuming fish caught in the River and engaging in body contact with the water.

2. NUMERIC TARGET

This section describes the numeric target that will be used to reduce trash levels to meet water quality objectives (Tables 2 and 3) that protect beneficial uses (Table 4) of the New River at the International Boundary.

A. NUMERIC TARGET

The level of trash in the New River downstream of the International Boundary varies hourly and daily, but always exceeds the numeric target. This TMDL establishes an interim numeric target of 75% reduction in trash within two years of USEPA approval of the TMDL, and establishes a final numeric target of zero trash (i.e., 100% reduction) within three years of USEPA approval of the TMDL for the New River immediately downstream of the International Boundary. These numeric targets are summarized in Table 5 below. Achieving the target is expected to result in the New River being: (a) unimpaired by solid waste, and (b) protective of beneficial uses from the International Boundary downstream to Calexico.

B. BASIS FOR NUMERIC TARGET

The numeric target was based on trash not being a naturally occurring pollutant. Therefore, there is no background concentration for trash. Additionally, scientific literature does not describe a load for trash that is suitable for aquatic life. Rather, scientific literature (Moore et al., in preparation; U.S. Environmental Protection Agency 1992) shows abundant evidence of adverse effects on water quality and wildlife populations for even small amounts of trash.

Table 5: NumericTargets for the Reduction of Trash in the New River at the International Boundary

	Time Period	Reduction from Existing Conditions
Existing Conditions	During TMDL development	0%
Interim Numeric Target	Within 2 years of USEPA approval of TMDL	75%
Final Numeric Target	Within 3 years of USEPA approval of TMDL	100%

3. SOURCE ANALYSIS

This section identifies and characterizes sources of trash that affect water quality in the New River at the International Boundary. A source analysis is necessary to determine: (a) the amount of trash reduction needed to meet numeric targets, and (b) the allocations to be distributed among sources of trash identified.

A. METHODOLOGY

Total trash load in the New River at the International Boundary is the sum of trash contributions from point and non-point sources as well as natural sources. Potential point and non-point trash sources include discharges of urban wastes to the New River and its tributary drains in Mexico. Therefore, total trash load can be expressed as:

$$L_{\text{New River at International Boundary}} = L_{\text{Urban Wastes + Wastewater Drains}} + L_{\text{Natural Sources}}$$

Load from Urban Waste Discharges and Wastewater Drains/Reaches
Regional Board staff estimated the amount of trash in the seven main drains/reaches in Mexicali that empty into the New River or its tributaries on the Mexican side of the International Boundary (Figueroa-Acevedo, personal communication 2004). Wastewater drain load for volume of trash was estimated for each drain/reach using the following equation:

Volume of trash = (Length x Width x Depth)

Where:

Volume of trash	=	Volume of trash, in cubic feet
Length*	=	Estimated length of accumulated trash along the drain, in feet
Width**	=	Estimated width of accumulated trash on the slope of the drain, in feet
Depth**	=	Estimated depth of accumulated trash, in feet

* Estimated using vehicle odometer.
** Estimated from field observations.

Wind and urban runoff were included implicitly in calculations for drains/reaches because data consisted of direct observation of accumulated trash, and did not distinguish between trash deposited by people, wind, or runoff.

Load from Natural Sources
Natural sources were considered but determined not to be a trash source because trash is defined for this TMDL as “improperly discarded waste material”. Naturally occurring materials (e.g., leaves and twigs) that wash into the waterway due to storms do not meet this definition of trash. Therefore, since trash is not a naturally occurring pollutant, there is no load from natural sources into the New River for this TMDL.

B. TRASH SOURCES AND CONTRIBUTIONS

The source analysis indicates that trash in the New River downstream of the International Boundary is the result of illegal dumping and littering into the River and its tributary drains in Mexicali, Mexico. As mentioned above, there are no natural sources of trash since trash is not a naturally occurring pollutant. An analysis of the trash-impaired drains in Mexicali is described below.

Wastewater Drains and Reaches

There are seven main drains in Mexicali that transport municipal, industrial, and agricultural wastewater, and illegally dumped trash (solids and dissolved constituents) into the New River. Table 6 lists the Mexicali drains that contribute to the trash impairment of the New River downstream of the International Boundary, and Figure 2 shows a map of these drains.

Table 6: List of Mexicali Drains/Reaches That Contribute to Trash Impairment of the New River at the International Boundary

Drain/Reach Name	Location
Tula West Drain	From Rio Santa Cruz Street to San Luis Rio Colorado (SLRC) Highway
Mexico Drain	From Gonzalez-Ortega Outfall to Mexicali Drain
Mexicali Drain	From Mexico Drain to Lake Xochimilco
Ken-Mex Drain	From Ken-Mex Outfall to Mexicali Drain
Puente Reforma	New River from Reforma Avenue to International Boundary
Del Norte Drain	Entire drain length
International Drain	Entire drain length

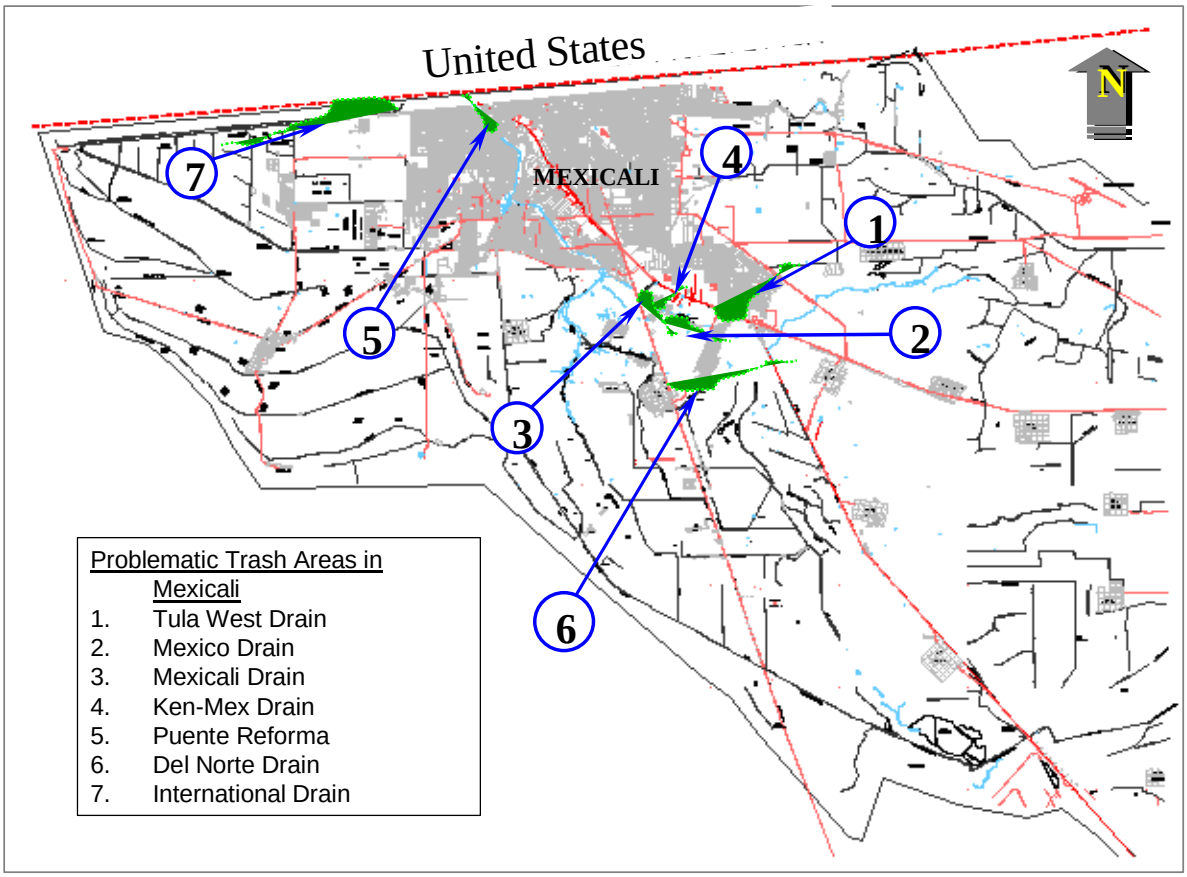

Figure 2: Map of Mexicali Drains/Reaches That Contribute to the Trash Impairment of the New River downstream of the International Boundary

These open drains, and reaches of the New River flanked by drains, receive and carry trash due to the lack of solid waste infrastructure in Mexicali, and dumping or littering by individuals. The drains occur peripherally to and within heavily populated metropolitan areas, open lots, and roads. Wind and urban runoff also contribute trash into the drains, and New River reaches flanked by these drains. Types of trash include: styrofoam, wooden boards, plastic containers, trash bags, tires, animal carcasses, diapers, raw sewage, plastic, household appliances, furniture, oil cans, dismantled cars, slaughterhouse wastes, glass, rubber, pesticides, cigarette butts, and household cleaning agents, among others (California Regional Water Quality Control Board 2003 a-e, 2004, 2005). Figures 3 through 9 provide examples of the types of trash typically found in these drains and New River reaches.

Figure 3: Tula West Drain, upstream of SLRC Highway

Figure 4: Mexico Drain, at Gonzalez-Ortega Outfall

Figure 5: Mexicali Drain, by abandoned landfill

Figure 6: Ken-Mex Drain, south view

Figure 7: Puente Reforma

Figure 8: Del Norte Drain

Figure 9: International Drain

The average level of trash for all drains and reaches combined is greater than 111,239 cubic feet on any given day. Table 7 shows existing trash levels for the individual drains/reaches in Mexicali. Calculations for each drain are contained in Appendix A.

Table 7: Existing Trash Levels for Mexicali Drains/Reaches

Drain/Reach Name	Volume (cubic feet)
Tula West Drain	28809
Mexico Drain	1998
Mexicali Drain	16011
Ken-Mex Drain	25002
Puente Reforma	Unknown
Del Norte Drain	39609
International Drain	810
All Combined	**Greater than 112239**

Some of the trash deposited in Mexicali wastewater drains, and in New River reaches flanked by these drains enters the U.S. through the New River. The exact amount is unknown but is estimated to be 120 tons/year (Imperial County Sanitation Department 2003). Most of this trash is collected and removed from the River when it intersects the Imperial County Calexico Landfill, which is located about four miles downstream of the International Boundary. Trash that enters the U.S. or remains within Mexico dissolves and leaches dangerous impairment-causing constituents (e.g., pathogens, organic matter, metals, and VOCs) into the New River threatening public health, and aquatic and wildlife communities. The New River Trash TMDL will eliminate trash in Mexico from crossing the International Boundary via the New River and degrading water quality downstream. Pollutants leached or dissolved from trash will be investigated if it is determined that water quality objectives downstream of the International Boundary are still being exceeded after implementation of this TMDL and the New River TMDLs for DO, VOCs, and pathogens, which address industrial/municipal pollution to the River in Mexico from sources other than trash.

4. SEASONAL VARIATIONS AND CRITICAL CONDITIONS

This section describes seasonal variations and critical conditions that have the strongest impact on trash conditions.

A. DEFINITIONS

Critical conditions are the set of environmental factors identified that must be taken into account to ensure attainment of water quality objectives under varying conditions. One typical critical condition is the time of year (season) that the water body is most vulnerable, which is often due to changes in climate or land usage.

B. LOCAL CLIMATE

The International Boundary area of the New River is located in Baja California, Mexico, and in Imperial County, California. The area is in the Colorado Desert region of the Sonoran Desert. The climate is hot with warm winters, dry summers, occasional thunderstorms, and gusty high winds with sandstorms. The area is one of the most arid in the U.S., with an average annual rainfall of about two inches and temperatures in excess of 100ºF for more than 100 days per year. Average temperature is 54ºF in January and 92ºF in July. Climate is relatively stable throughout the year without the wide swings in temperature and rainfall found in other parts of the United States.

C. LOCAL LAND USAGE AND FLOW

Land usage in the vicinity of the New River in Mexico is 100% municipal, as the New River headwaters are in the City of Mexicali. Treated and untreated wastewater from the municipality accounts for 30-40% of the New River's flow in Mexico, and totals about 40-45 million gallons per day (MGD). The remaining 60-70% of the flow is from agricultural activities in the Mexicali Valley, which discharge approximately 55-70 MGD to the New River via agricultural tributary drains.

Agricultural discharges vary depending on the time of year, with decreased flows in winter due to decreased irrigation. Winter months may see an increase in contaminant concentrations (e.g., bacteria, oil, chemicals) in the River downstream of the International Boundary due to the reduced flow. Average annual flow of the New River ranges from 180-200 cfs (about 182,000 acre-feet/year) at the International Boundary (Tetra Tech, Inc. 1999).

New River flow at the International Boundary is projected to decrease in 2006 when construction of the wastewater treatment plant (WWTP) in Las Arenitas, Mexico, is completed. This facility is designed to treat 800 l/sec (approximately 18.25 MGD) of raw sewage. About 450 l/sec of raw sewage is currently bypassed to the New River due to inadequate sewage infrastructure. Effluent generated from the Las Arenitas WWTP will be discharged to the Hardy River located outside the New River watershed.

In addition to the Las Arenitas WWTP there are two energy plants (Sempra and Intergen) that currently purchase an estimated 10.3 MGD[4] of raw and treated water from the Zaragoza WWTP

[4] (450 l/sec*0.2642 gal/l /sec* 86400sec/day= 10, 272,096 gal/day)

for use in their cooling towers. When operating at full capacity, the energy plants and Las Arenitas wastewater treatment facility will reduce flow at the International Boundary by an estimated 900 l/sec, or about 17% (Figueroa-Acevedo, personal communication 2004). Concentrations of some pollutants dissolved or leached from trash may increase as a result of this reduction in flow.

D. IDENTIFIED SEASONAL VARIATIONS

Trash is discharged to the New River from Mexico and crosses the International Boundary into the U. S. regardless of the season, although more flow in summer months causes more trash to be carried at that time. Conversely, concentrations of some pollutants (e.g., pathogens, organic matter, and volatile organic compounds) may increase when flow is low.

[5] Considering an average flow of 180 cfs

5. LINKAGE ANALYSIS

The linkage analysis involves establishing the relationships (i.e., linkages) between the numeric target, trash sources, trash allocations, and assimilative capacity of the New River. Such information is useful in evaluating the degree and duration of required effort, including mitigation options, to achieve WQOs. For this TMDL, there is a one-to-one relationship between load allocations and numeric targets.

Illegal discharges of solid wastes to the New River in Mexico are the source of trash to the River at the International Boundary. Trash occurs in the New River at the International Boundary because Mexicali does not have an adequate solid waste management plan to collect and properly dispose of municipal solid waste. The New River's assimilative capacity for trash is defined as the highest trash load that the New River can assimilate without exceeding the numeric target. Therefore, assimilative capacity is based on the numeric target. Assimilative capacity for any time period can be expressed mathematically as:

Assimilative Capacity = (Allowable Load + Margin of Safety Load) + Natural Sources Load

This TMDL has a final numeric target of zero trash. Therefore, the final allowable load is zero trash.

With respect to the margin of safety load, TMDLs include a margin of safety to account for data uncertainty, growth, critical conditions, and lack of knowledge. This TMDL includes an implicit margin of safety, meaning that the margin of safety is incorporated into the conservative processes used to develop the TMDL. Therefore, the margin of safety is not quantified for this TMDL.

Trash is not a naturally occurring pollutant. Therefore, the natural sources load is not applicable for this TMDL.

Applying this information, assimilative capacity is calculated as follows:

Assimilative Capacity = **(**Allowable Load (0) + Margin of Safety Load (0)**)**
= Natural Sources Load (0)
= 0 tons/year

State and federal law prevents the discharge of trash to surface waters to protect water quality objectives and beneficial uses. Solid waste in California must be disposed of in accordance with Title 27 of the California Code of Regulations. Thus, it is prohibited from being discharged into surface waters. When compliance with existing law and regulations is achieved, trash levels are expected to be within the assimilative capacity of the New River at the International Boundary. At that time, the numeric target in the New River will be achieved.

6. LOAD ALLOCATIONS AND WASTELOAD ALLOCATIONS

This section quantifies and allocates the amount of trash reduction required to attain water quality standards in the New River at the International Boundary.

A. METHODOLOGY

USEPA TMDL Guidelines (USEPA 2001) define the maximum allowable pollutant load as the total load of a particular pollutant that can be present in a waterbody while still attaining and maintaining designated beneficial uses. The maximum allowable pollutant load is reduced by a margin of safety. The remaining allowable pollutant load is allocated to point pollution sources (Wasteload Allocation, WLA) and nonpoint pollution sources (Load Allocation, LA).

A TMDL is the sum of load allocations for nonpoint sources[6] (e.g., wastewater drains), individual wasteload allocations for point sources (e.g., wastewater treatment plants), a margin of safety, and natural sources. These loads make up the Assimilative Capacity of the New River, as discussed in the previous section. The TMDL is theoretically equivalent to the Assimilative Capacity.

TMDL = (Load Allocations + Wasteload Allocations + Margin of Safety) + Natural Sources = Assimilative Capacity

TMDLs include a margin of safety to account for data uncertainty, growth, critical conditions, and lack of knowledge. This TMDL includes an implicit margin of safety, meaning that the margin of safety is incorporated into the conservative processes used to develop the TMDL. Therefore, the margin of safety is not quantified for this TMDL.

B. SPECIFIC ALLOCATIONS BY SOURCE

The source analysis shows that waste discharges in Mexico to the New River and tributary drains is the only source of trash to the New River downstream of the International Boundary. The allowable load cannot be distributed among these drains because the Regional Board has no jurisdiction over waste discharges originating in Mexico. Consequently, the full allowable load can only be designated to the trash load crossing into the U.S. at the International Boundary in Calexico.

Trash is not a naturally occurring pollutant, and accordingly a natural sources load is not applicable. For the purpose of this TMDL, the contribution from Mexico to the New River at the International Boundary is treated as a nonpoint source. Table 8 summarizes the allocations derived from the interim and final numeric targets, for the sole source of trash.

[6] For the purpose of this TMDL, the contribution from Mexico to the New River at the International Boundary is treated as a nonpoint source.

Table 8: TMDL Allocations by Source

Source	Existing load (tons/year)	Interim Numeric Target* Allocation (tons/year)	Final Numeric Target** Allocation (tons/year)
New River Trash Load Immediately Downstream of the International Boundary	120	30	0

* interim numeric target = 75% reduction in trash from existing conditions to be achieved within two years of USEPA approval of this Trash TMDL

** final numeric target = 100% reduction in trash from existing conditions to be achieved within three years of USEPA approval of this Trash TMDL

7. IMPLEMENTATION PLAN

This section identifies the entities, and describes requested actions to be taken by those entities, to achieve the TMDL. This section also describes Regional Board provisions and reporting requirements.

A. IMPLEMENTATION PLAN COMPONENTS

The Regional Board must approve Implementation Plans to achieve adopted Water Quality Objectives (CWC § 13242). Implementation Plans must include:

1. Necessary actions to achieve Water Quality Objectives, including recommendations for public or private entities;
2. Time schedules for actions; and
3. Monitoring and surveillance to determine compliance.

B. THIRD PARTY COOPERATING AGENCIES AND ORGANIZATIONS

Third party cooperating agencies and organizations are pivotal in achieving TMDL compliance. These entities have technical expertise, resources, and organizational structures that facilitate effective implementation of practices to address trash impairment.

United States Government (USIBWC and USEPA)
The International Boundary and Water Commission (IBWC) is a U.S.-Mexican federal agency with roots in the "Treaty of Guadalupe Hidalgo of Peace, Limits and Settlement," signed by both countries in February 1848. The IBWC was established as the International Boundary Commission (IBC) in 1889 to deal with boundary issues. In 1944, the U.S. and Mexico signed the treaty entitled "Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande" (Mexican-American Water Treaty), which was ratified by the U.S. Congress in 1945. The Mexican-American Water Treaty changed the name of the IBC to the IBWC, and expanded IBWC jurisdiction and responsibilities. Both the U.S. and Mexico have commissioners appointed to the IBWC. In Mexico, the IBWC is called “Comision Internacional de Limites y Aguas” (CILA).

The U.S. Section of IBWC (USIBWC) is part of the State Department. USIBWC jurisdiction extends along the International Boundary and inland into both countries where international projects are constructed. Responsibilities include the application of International Boundary water treaties and settling of water treaty differences that arise. The treaty specifies that the USIBWC is responsible for solving sanitation and water quality problems at the International Boundary in cooperation with its Mexican counterpart.

The Presidents of Mexico and the United States signed the La Paz Agreement in August 1983. The La Paz Agreement made the U.S. Environmental Protection Agency (USEPA) the U.S. coordinator for pursuing practical, legal, institutional and technical measures to protect and improve the environment at the International Boundary. The agreement originally made the Mexican Secretaría de Desarrollo Urbano y Ecologia (SEDUE) the coordinator for Mexico. In 1992, Mexico transferred responsibility for International Boundary issues to the Secretaría de Desarrollo Social (SEDESOL). Currently, the Secretaria del Medio Ambiente Recursos Naturales y Pesca (SEMARNAP) has jurisdiction regarding the environment, natural resources, and

fisheries issues. The Comision Nacional del Agua (CNA) has primary responsibility for water issues in Mexico in the International Boundary area.

To achieve this TMDL, trash must be eliminated from the New River and its tributaries in Mexicali, and immediate steps need to be taken to stop trash from crossing the International Boundary via the New River. This will require cooperation from Mexico and U.S. assistance.

New River/ Mexicali Sanitation Program Binational Technical Advisory Committee
The New River/Mexicali Sanitation Program Binational Technical Advisory Committee (BTAC) oversees the measures identified in Minute No. 288 titled "Conceptual Plan for the Long Term Solution to the Border Sanitation Problem of the New River at Calexico, CA – Mexicali, Baja California." Minute No. 288 established short- and long-term solutions for sanitation problems that plague the New River at the International Boundary. The primary focus of Minute No. 288 is to improve wastewater infrastructure. Short-term measures were completed in 1999. Long-term measures are scheduled to be completed in February 2006. Long-term measures financed by the North American Development Bank include, among others, the building of a 20-MGD wastewater treatment plant, and reconstruction/installation of 21 miles of sewage pipes in the Mexicali metropolitan area.

Minute No. 288 was signed in October 1992 by USIBWC and its Mexican counterpart (CILA). USIBWC and CILA also are working with other federal and state agencies on both sides of the border, including the Regional Board, to address New River water quality problems at the International Boundary. The establishment of BTAC has improved communication and the transfer of technology between Mexico and the United States. The State Board and the Regional Board remain committed to working with all agencies and groups addressing New River pollution. Table 9 identifies BTAC members.

Table 9: Binational Technical Advisory Committee (BTAC) Members

Mexico	United States
Comision Internacional de Limites y Aguas (CILA, Mexican Section of IBWC)	USIBWC (U.S. Section of IBWC)
Secretaria del Medio Ambiente Recursos Naturales y Pesca (SEMARNAP)	USEPA
Comision Nacional del Agua (CNA, Mexican National Water Commission)	California State Water Resources Control Board
Secretaria de Asentamiento Humanos y Obras Públicas del Estado (SAHOPE)	California Regional Water Quality Control Board, Colorado River Basin Region
Comision Estatal de Servicios Publicos de Mexicali (CESPM)	Imperial County
Municipality of Mexicali	Imperial Irrigation District
Comision de Cooperacion Ecologica Fronteriza (CCEF), Mexico Section	Border Environment Cooperation Commission (BECC), U.S. Section

North American Development Bank
The North American Development Bank (NADBank) was created by the North American Free Trade Agreement (NAFTA). NADBank is a binationally funded organization in which Mexico and the United States are equal partners. NADBank serves as lead financier for public entities that seek financing for environmental infrastructure projects in the International Boundary region. They also assist border communities in identifying funding sources and designing financial plans for wastewater infrastructure projects. Services provided by NADBank include participation in bond issues, interim financing, grant resources and government budget allocations through Border Environment Infrastructure Funds, loan guaranties, and technical assistance through the Border Environment Cooperation Commission.

Border Environment Cooperation Commission
The Border Environment Cooperation Commission (BECC) was created by NAFTA. BECC is a binational organization with headquarters in the United States and Mexico. BECC developed a Technical Assistance Program to assist eligible border communities with preliminary engineering and design studies. The focus of the Technical Assistance Program is to: (a) develop projects that address environmental problems, (b) achieve BECC certification for the projects, (c) provide grants to communities for technical assistance, and, (d) assist communities in obtaining BECC certification (a prerequisite for funding from NADBank and/or other sources). Funding for projects under the Technical Assistance Program is provided by the USEPA. BECC is working with Mexico on developing and implementing a comprehensive solid waste management plan for the City of Mexicali. This project involves encasing principal drains (e.g., Tula Drain) that flow through the Mexicali metropolitan area.

California Border Environment Cooperation Commission
The California Border Environment Cooperation Commission (CalBECC) was created in 1994 by the governors of California, Baja California, and Baja California Sur. CalBECC identifies and promotes environmental infrastructure projects along the border, establishes border priorities, and solicits project funding. CalBECC can assist owners of wastewater treatment facilities to solicit funds to comply with this TMDL. CalBECC staff is part of the State Board's Border Program.

City of Calexico New River Committee
The City of Calexico New River Committee (CCNRC) is a nonprofit organization organized in 1999. Their primary goal is to encase the U.S. section of the New River in the Calexico area, from the International Boundary to Highway 98. The Committee is seeking approximately $50 million from the U.S. Congress and others, to finance the project. Members of the committee include the U.S. Border Patrol, Calexico School District, Campesinos Unidos, City of Calexico, Imperial County, Imperial Irrigation District, Imperial Valley College, and San Diego State University's Imperial Valley Campus.

Citizens Congressional Task Force on the New River
The Citizens Congressional Task Force on the New River (CCTFNR) is a group that was established by Congress to help address New River pollution. CCTFNR built two wetland demonstration projects (Brawley Wetlands and Imperial Wetlands) and an aeration structure in the New River about 1 mile downstream of the Boundary. Congress funded this project, and cooperating agencies (Imperial County and Imperial Irrigation District) provided in-kind services and donated land. CCTFNR is proposing to build additional wetlands and aeration structures for the New River near the Boundary.

D. IMPLEMENTATION PHASES, ACTIONS, AND MILESTONES

The Implementation Plan consists of two phases, and uses an interim numeric target to assess compliance progress. Phase I calls for a 75% trash reduction within two years of USEPA approval of the TMDL. Phase II calls for a 100% trash reduction within three years of USEPA approval of the TMDL. This phased approach provides immediate control of trash sources while allowing time for additional monitoring to assess effectiveness and potential need for modification. Table 10 shows numeric targets in relation to Implementation Plan phases.

Table 10: Implementation Plan Phases and Numeric Targets

Phase	Time Period	Estimated Reduction*	Numeric Target (tons/year)
Phase I	Within two (2) years of USEPA approval of the TMDL	75%	30
Phase II	Within three (3) years of USEPA approval of the TMDL	100%	0

* Percent reduction required at the end of each phase, starting with the current (2005) average of 120 tons/year.

Implementation Plan measures should be sufficient to achieve the TMDL so long as the third parties mentioned above are willing to complete the requested tasks below within the timeframes specified.

Actions to be taken by Third Party Cooperating Agencies and Organizations

Consistent with the California Porter-Cologne Water Quality Control Act, the Basin Plan may identify requested implementation actions for agencies other than the Regional Water Quality Control Board (CWC §13242(a)). Accordingly, the Regional Board requests that the following cooperating agencies sign a Memorandum of Understanding (MOU) to ensure coordination of International Boundary projects: U.S. members of the New River/ Mexicali Sanitation Program Binational Technical Advisory Committee (BTAC), North American Development Bank (NADBank), Border Environment Cooperation Commission (BECC), California Border Environment Cooperation Commission (CalBECC), City of Calexico New River Committee (CCNRC), and Citizens Congressional Task Force on the New River (CCTFNR). The MOU should address:

1. Establishment of a coordination committee consisting of one representative from each agency and the Regional Board;
2. Establishment of a coordination committee charter to ensure cooperation and communication between all agencies;
3. Compilation of a list of potential/ongoing projects and funding sources to address pollution in the New River/ International Boundary area; and
4. Submission of semi-annual progress reports to the Regional Board.

The MOU should be signed, and progress reports submitted, in accordance with the schedule in Table 11.

Table 11: Requested Actions for Third Party Cooperating Agencies and Organizations

Task	Due Date
1. Submit signed MOU to the Regional Board.	Six (6) months after USEPA approval of TMDL
2. Submit progress reports (through coordination committee) to the Regional Board describing status of projects and recommended actions to address pollution in the New River at the International Boundary.	Semiannually, with the first report due 12 months after USEPA approval of TMDL

Actions Requested to be taken by the U.S. Government

The Regional Board does not have the authority to require Mexico or the U.S. Government to reduce trash that crosses the International Boundary. Accordingly, this TMDL requests that the U.S. Government (i.e., the USIBWC and the USEPA):

1. specify and implement measures to ensure that trash discharges from Mexico do not violate or contribute to a violation of this TMDL;
2. remove trash from Mexico that has accumulated at Imperial County Calexico Landfill culverts; and
3. conducts water quality and trash monitoring in the New River at the International Boundary to evaluate for water quality impacts from trash.

It is critical that the U.S. Government coordinates activities with the other third party coordinating agencies and organizations:

1. to implement reasonable, timely measures to mitigate trash impacts on U.S. water quality in the New River/ International Boundary area;
2. to ensure bi-national standards of Minute No. 264 are met; and
3. to persuade Mexico to prevent littering of Mexican surface waters that impact water quality in the New River/ International Boundary area[7].

The Regional Board requests that the USIBWC and USEPA complete the trash reduction actions listed in Table 12.

Table 12: Requested Trash Reduction Actions for the USIBWC and USEPA

Task	Requested Target Date
1. Describe in a report* current and/or proposed measures to ensure Mexico complies with this TMDL. The report should specify parties responsible for implementation, financial options, and implementation time schedule.	Three (3) months after USEPA approval of TMDL

[7] Removing trash from the New River at or immediately downstream of the International Boundary does not eliminate all water quality impacts because pollutants leached from trash in Mexico may contaminate the New River in the U.S. Pollutants dissolved from trash will be addressed if it is determined that water quality objectives at the International Boundary are still being exceeded after implementation of this TMDL and the New River TMDLs for VOCs, DO, and pathogens.

2. Describe in a report* the current and/or proposed measures to remove trash from Mexico that has accumulated at Imperial County Calexico Landfill culverts. The report should specify the parties responsible for implementation, financial options, and implementation time schedule.	Three (3) months after USEPA approval of TMDL
3. Begin implementation measures identified in Tasks 1 and 2.	Six (6) months after USEPA approval of TMDL
4. Describe in a report* the progress achieved towards completion of implementation measures identified in Tasks 1 and 2.	Semiannually, beginning 12 months after USEPA approval of TMDL
5. Complete implementation measures identified in Tasks 1 and 2.	Three (3) years after USEPA approval of TMDL
* The report should be prepared under the direct supervision of a California registered civil engineer, with experience in the preparation of these types of reports.	

The Regional Board also requests that the USIBWC and the USEPA implement the water quality and trash monitoring in the New River at the International Boundary that is summarized in Table 13 below, and submit monitoring reports to the Regional Board according to the schedule specified in the table. The Regional Board requests that monitoring be conducted in accordance with a Quality Assurance Project Plan (QAPP). Water Quality samples from the New River shall be collected at the closest practical site on the U.S. side of the International Boundary.[8]

[8] It may be impractical to take water quality samples immediately at the International Boundary because wastewater infrastructure (e.g., treatment lagoons, raw sewage bypasses, and drains) empties into the New River at this location, causing mixing/aeration of water that could yield misleading monitoring results. The closest water quality monitoring site currently in use (for International Boundary Line and the State Water Board's Surface Water Ambient Monitoring Program, SWAMP) is located in the New River at the Imperial Irrigation District Bridge, near the U.S. Geological Survey water quality gage, about 0.5 mile from the International Boundary. The party that conducts monitoring for this TMDL should explore using locations closer than the currently used water quality monitoring site.

Table 13: Requested Monitoring Actions for the USIBWC and USEPA

Task	Requested Target Date
1. Prepare a monitoring plan and QAPP to monitor water quality and trash in the New River at the International Boundary.	Three (3) months after USEPA approval of TMDL
2. Implement water quality and trash monitoring in the New River at the International Boundary, pursuant to the QAPP.	Six (6) months after USEPA approval of TMDL
3. Submit monitoring data and reports to the Regional Board.	Semiannually, beginning 12 months after USEPA approval of TMDL

E. REGIONAL BOARD MONITORING AND TRACKING PROGRAM

Regional Board staff will coordinate the TMDL Monitoring and Tracking Program. It is important to track TMDL implementation, monitor water quality progress, and modify TMDLs and Implementation Plans as necessary because the Regional Board wants to:

1. Address uncertainty that may have existed during TMDL development;
2. Ensure that implementation is occurring; and
3. Ensure TMDL effectiveness, given watershed changes that may have occurred after TMDL development.

Water Quality and Trash Monitoring

The Implementation Plan calls for water quality and trash monitoring to determine TMDL progress, and to revise the TMDL as needed. Monitoring program objectives include evaluation of:

1. water quality objectives attainment;
2. implementation effectiveness;
3. in-stream water quality; and
4. water quality temporal and spatial trends.

Regional Board staff requests that USIBWC and USEPA conduct water quality and trash monitoring of the New River at or immediately downstream of the International Boundary, and submit monitoring data and reports to the Regional Board.

Implementation Tracking Program

The Implementation Plan calls for a tracking program to assess implementation. Objectives include assessment and tracking of measures already in place, and evaluation of TMDL progress. Regional Board staff will evaluate data to determine when numeric targets are attained, and will present annual reports to the Regional Board describing progress.

Measures of Success, and Failure Scenarios

The primary measure of success for TMDL implementation is attainment of zero trash in the New River at the International Boundary within three years of USEPA approval of the TMDL. Another measure of success may be a substantially lower level of trash than currently exists,

such as meeting the interim numeric target (i.e., 75% trash reduction within two years of USEPA approval of the TMDL).

The primary failure scenario for TMDL implementation is the failure to achieve zero trash in the New River at the International Boundary, or the failure to substantially reduce trash if zero trash is not achieved. If this occurs, the Regional Board will consider further actions.

F. TMDL REVIEW SCHEDULE

Annual Reports

Regional Board staff shall present annual reports to the Regional Board describing progress toward milestone attainment. The reports will assess:

1. Water quality improvement, in terms of trash reduction at the International Boundary;
2. Control measures implemented to deal with pollution originating in Mexico;
3. Whether milestones were met on time or at all. If milestones were not met, the reports will discuss the reasons; and
4. Recommendations for further actions.

Triennial Review

The State must hold public hearings for reviewing applicable water quality standards (WQS), and modifying/adopting the standards as appropriate, pursuant to Section 303 of the Clean Water Act and to 40 CFR 130. The State also must formulate and periodically review (and update as necessary) Regional water quality control plans, pursuant to Section 13240 of the California Water Code. Following adoption by the Regional Board, Basin Plan amendments and supporting documents are submitted to the SWRCB and then the State Office of Administrative Law for review and approval. USEPA also has approval authority over Basin Plan amendments.

The first TMDL review is scheduled to conclude three years after TMDL adoption to provide adequate time for implementation and data collection. At this time, TMDL compliance should be achieved. If the TMDL is not achieved, the Regional Board will consider further actions. Subsequent reviews (if needed) will be conducted concurrently with the Triennial Review of the Basin Plan. The TMDL Review will include the same components assessed in annual reports, and will conform to the schedule in Table 14.

Table 14: TMDL Review Schedule

Activity	Date
USEPA Approval of TMDL	December 2006
Terminate First TMDL Review, and Conduct Regional Board Public Hearing	December 2009
Begin Second Review	December 2009
Terminate Second TMDL Review, and Conduct Regional Board Public Hearing	December 2012
Etc.	

* Dates are contingent upon USEPA approval

Public hearings will be held at least every three years to review this TMDL. At these hearings, the Regional Board will:

- review monitoring results;
- review progress toward milestone attainment;
- consider approval of proposed management practices;
- consider enforcement action; and
- consider revision of TMDL components.

This proposed review schedule indicates the Regional Board's commitment to periodic review and refinement of this TMDL, via the Basin Plan amendment process.

8. ECONOMIC IMPACTS

Regional Board staff is required to "consider costs" associated with the establishment of water quality objectives (CWC §13241(d)). This TMDL does not establish new water quality objectives, but rather is a plan for achieving existing water quality objectives. Therefore, cost considerations required in CWC §13241 are not required. Nevertheless, it was determined that conducting an economic assessment would be helpful for budgeting purposes. Accordingly, an economic assessment was completed to estimate the cost of physically removing trash from the New River immediately downstream of the International Boundary using a mechanical screen.

The economic assessment does not address secondary water quality impacts caused by pollutants leached or dissolved from trash, which will be addressed only if water quality objectives downstream of the Boundary are still exceeded after implementation of this TMDL, and New River TMDLs for DO, VOCs and pathogens. It would not be possible to accurately characterize and quantify contaminants leached from trash without first reducing pollutant levels at the Boundary due to Mexican municipal/industrial sources addressed by these New River TMDLs.

The economic assessment evaluated labor and machinery costs to remove trash from the New River. These, and other costs associated with trash removal from the New River are described below. Water quality sampling and analysis costs are also provided.

A. Trash Collection Costs:

1. The Brackett Bosker Raking Machine (BBRM):

There are a number of management practices available to eliminate solid wastes from rivers. One effective management practice evaluated for this TMDL involves installing a bar screen and trash collection system immediately downstream of the International Boundary. An example of such a system is the Brackett Bosker Raking Machine (BBRM) described below. BBRM is ideal for the New River because there is no manual handling of collected trash, thereby minimizing safety concerns due to physical contact with hazardous materials from the River.

The BBRM essentially functions as three machines: a trash rake, a conveyor, and a trash loading system. The automated raking machine can operate 24 hours a day, effectively removing screen obstructions from trash. Debris is then loaded into a dumpster without physical handling of trash. The screen deck may be customized to access multiple screens or remote dumping areas. The BBRM can function automatically or manually by a single individual (Gathright 2005).

In automatic mode, the raking machine migrates from the start signal to the designated screen area stopping above the first pickup location. A gripper moves to the base of the screen collecting trash in its jaws. Cylinders close the gripper, which is then elevated to a trolley by a hoist. The trolley returns the gripper to the trash container where it releases the captured debris. The raking machine then moves to the next pickup location on the screen repeating the cycle until the screen is trash free (Gathright 2005).

It would be important to install a structural BBRM in the New River as close as practicable to the border in order to maximize the effectiveness of the machine's capabilities in capturing trash form Mexicali. By installing the BBRM in this location, trash solids in the New River that originate in Mexico will be effectively eliminated.

2. Disposal Costs:

Trash captured by the raking machine can be stored in a trash container (40' x 8' x 9'6") and transported to a waste management facility permitted to accept waste from the New River.

Table 15: BBRM Installation Cost Estimates by Implementation Year

Number of Years into the Program	1	2	3
[1]Cumulative annual Operation and Maintenance Costs	$70,908	$141,817	$212,725
[2]Initial Capital Costs	$2,355,070	$0	$0
Annual Costs per year (Initial Capital Costs + Operation and Maintenance)	$2,425,978	$141,817	$212,725

Capital costs for the BBRM is estimated at $2.35 million, and three years of operation and maintenance with implementation is estimated at $213,000.

Please see Appendix B.

B. Trash Monitoring Costs:

The collected trash will be characterized and quantified before transport to the landfill or treatment facility. The costs associated with this work are included in the BBRM operation costs.

C. Water Monitoring Costs;

Table 16 below provides cost estimates for water quality analyses recommended for monitoring at the International Boundary, or immediately downstream, for the implementation phase of this Trash TMDL. Estimates are based on the 2005 price list from the California Department of Health Services Sanitation & Radiation Laboratory in Los Angeles. The cost for personal protective equipment, and for equipment to collect water samples or measure field parameters (DO, pH, temperature and Electrical Conductivity), is not included.

Table 16: Cost estimates for water quality analyses

ORGANIC CHEMICAL ANALYSES MONITORING		
Test:	**Method**	**$ per sample**
1) Volatile Organic Compounds by Purge & Trap and GC/PID/ElCD*	EPA502.2	195
2) Organohalide Pesticides and PCB by Microextraction and GC*	EPA505	220
3) Chlorinated Pesticides by GC/ECD	EPA508	250
4) MTBE and BTEX by Capillary Column GC/MS	EPA524.2	140
5) Diesel/Motor Oil by Solvent Extraction and GC/FID	3050/8015	165
GENERAL MINERAL, PHYSICAL AND AGGREGATE PROPERTIES		
1) Alkalinity	EPA 310.1	30
2) Color	SM2120B	45

3) Conductivity	EPA 120.0	20
4) Odor	SM2150B	30
5) pH	EPA 150.1	15
6) Turbidity	EPA 180.1	25
7) Settleable solids	EPA 160.5	35
8) Suspended solids	EPA 160.2	35
9) Total dissolved solids	EPA 160.1	35
10) Hardness	SM 2340C	50
METALS		
Metal Digestion		100
1) Arsenic	EPA 200.7	25
2) Cadmium, Chromium, Copper, Lead,	EPA 200.8	100
3) Mercury, Selenium, & Zinc	EPA 200.9	75
4) Chromium, hexavalent	EPA 218.6	125
INORGANIC NONMETALLIC CONSTITUENTS		
1) Anions by ion chromatography (F^-, Cl^-, NO_2^-, NO_3^-, SO_4^{2-}, PO_4^{3-})	EPA300.0/300.1	150
2) Nitrogen, ammonia	4500-NH_3 D	35
3) Nitrogen, nitrate	EPA300.0/300.1	35
4) Nitrogen, nitrite	EPA300.0/300.1	35
5) Nitrogen, organic	4500-NH_3 D/-N_{org} B	135
6) Nitrogen, total (Kjeldahl)	SM4500-N_{org} B	100
7) Perchlorate	EPA314.0	70
8) Phosphate, ortho	EPA300.0/300.1	35
9) Phosphate, total	EPA365.2/SM4500-P B/F	100
10) Sulfate	EPA300.0/300.1	35
AGGREGATE ORGANIC CONSTITUENTS		
1) BOD-5day	SM5210B	90
2) *cBOD (using Polyseed NX, nitrogenous inhibitor)	SM5210B	90
3) COD	SM5220B	60
4) MBAS (Surfactants)	SM5540C	100
5) Oil and Grease	EPA 1664	85
6) Phenols	EPA 420.2	100
7) *TOC	SM5310B/C	85
ENVIRONMENTAL MICROBIOLOGICAL EXAMINATIONS		
Enumeration from Source or Raw Surface Water:	**Method**	**$ per sample**
1) Coliform (Total, Fecal & *E.coli*), 5-tube MTF	SM: 9221 A-C, E, F	70
2) Fecal Streptococci by MF on mE,**	SM: 9230C	65

Total (all tests) = $3,190 per month

Total estimated costs for organic, inorganic, and biological analyses for one water quality monitoring event, based on 2005 prices for the California Department of Health Services Sanitation & Radiation Laboratory in Los Angeles, is $3,190.

As previously mentioned, the Trash TMDL Implementation Plan consists of two phases: Phase I requires a 75% trash reduction within two years of USEPA approval of the TMDL, and Phase II requires a 100% trash reduction within three years of USEPA approval of the TMDL. Cost estimates to conduct monthly water quality monitoring at the International Boundary for the constituents recommended for the implementation phases are provided in Table 17 below.

Table 17: Cost estimates for water quality analyses by implementation year

Implementation Year	**1**	**2**	**3**
Cumulative Annual Cost (Based on $3190/month)	$38,280	$76,560	$114,840

[1] Operation and Maintenance Costs include costs for materials and supplies used for maintenance and repair (annual cost based on 25 year life) and transportation of trash to the landfill (Larson 2003).
[2] Initial Capital Costs include planning, design, labor, materials, supplies, and services during construction (Gathright 2005; Anderson 2005.)
* SRLS does not use these methods.
** Environmental Microbial Diseases Section, Microbial Diseases Laboratory, Division of Communicable Disease Control

9. BASIN PLAN AMENDMENT SUMMARY

Attachment 1 includes a draft Regional Board Resolution to adopt the draft Basin Plan Amendment (Attachment 2) establishing this TMDL and TMDL Implementation Plan.

The draft Basin Plan Amendment requests that third party cooperating agencies and organizations specify and implement measures to ensure that trash discharges from Mexico do not violate or contribute to a violation of this TMDL. The Basin Plan Amendment:

- Summarizes TMDL elements, including the Problem Statement, Numeric Target, Source Analysis, Margin of Safety, Seasonal Variations and Critical Conditions, Loading Capacity, and Load Allocations and Wasteload Allocations.

- Establishes an interim numeric target of 75% reduction in trash within two years of USEPA approval of the TMDL, and a final numeric target of zero trash within three years of USEPA approval of the TMDL, for the New River at the International Boundary.

- Incorporates a TMDL Implementation Plan, as required by Section 13242 of the Porter-Cologne Water Quality Control Act, that includes designation of responsible parties and cooperating agencies/organizations, a description of required and requested actions, time schedules, and Regional Board compliance monitoring.

- Describes the Regional Board TMDL review process.

- Includes Regional Nonpoint Source Control Program elements.

- Updates and/or deletes dated information that is no longer accurate.

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